2157

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 65.00

Complete if Known	
Application Number	09/911,090
Filing Date	7/23/2001
First Named Inventor	Romanik, Philip
Examiner Name	AVI GOLD
Art Unit	2157
Attorney Docket No.	

METHOD OF PAYMENT (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 20 or HP =	_____	x _____	=	_____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 3 or HP =	_____	x _____	=	_____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
_____	- 100 =	_____	/ 50 =	_____	(round **up** to a whole number) x	_____	=	_____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): Defective Declaration 37 CFR 1.16(e)	65.00

SUBMITTED BY

Signature	Philip Romanik	Registration No. (Attorney/Agent)	Telephone 203-933-5174
Name (Print/Type)	Philip Romanik		Date 6/6/2005

In re patent application of

Philip Romanik, et al.

Application No: 09/911,090 Examiner: Avi Gold

Filing Date: 23 July 2001 Art Unit: 2157

Title: IMAGE TRANSFER AND ARCHIVAL SYSTEM

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Table of contents

Response to First Office Action

This is a response to your office action which rejected claims from our patent application, "Image Transfer and Archival System", filed on July 23, 2001. I will address your points one by one, but I believe all the rejected claims should be accepted. The Tanaka patent (U.S. Patent 6,564,256) you rely on heavily, covers different subject matter.

Please note that I did not have a customer number when this patent was filed. However, I have since obtained customer number 000052697.

I am attaching a new declaration page. I did not realize that the date alteration was an issue. I am also including a fee transmittal and check to correct the defective declaration.

General Comments

Our invention relates to a method and system to transmit digital images from a source (the client device) to a server (the server device). An example of a client device is a machine vision system that captures digital images for inspection. Most machine vision systems discard the images once the inspection is complete. Our invention discloses a method to transmit and archive these images on remote, server machine(s). Under perfect conditions, the image(s) can be transmitted without loss of resolution, and transmission completes before the next image is ready. The purpose of transmitting an image to a server machine is for later analysis, validation, reporting, or some other purpose.

The Tanaka patent discloses a way to cache information in a traditional client/server image transfer system. In the Tanaka model, there can be multiple terminals, multiple relay servers, and multiple caches. A request originates from a terminal, and passes through one of many relay servers. If the relay server contains the information in its cache, the information can be immediately returned. If the information is not available locally, the relay server contacts either an archiver or database to obtain the image. Multiple servers are used to reduce the load on a single machine, and offers enhanced reliability and throughput.

Our invention does not use the Tanaka model, nor does the Tanaka patent describe how our image transfer and archival system works. In our invention, images originate on a client device, such as a machine vision system. They are transmitted as a digital signal to a server device for additional processing or storage. The transmission from client device to server device occurs on a network. Like all networks, there are limitations to the throughput with which data may travel across the network. In most networks, data throughput varies greatly at any moment in time. In large network environments, network traffic can completely stop while the network reconfigures itself to route around bottlenecks in the system. In a perfect network environment, the client devices transmit their image information to a server device without any hindrance. In real networks, problems can occur at any time. Simple image buffering on a client device may not be sufficient to allow 100% of the desired images to be transmitted to the server device. Our invention describes a number of rules to manipulate the image, using both lossless and lossy methods to compress or resize the images. These new images consume less space and have a greater chance of being successfully transmitted from the client device to the server device.

I will now address your issues on a claim by claim basis.

Claim 1

A system for transmitting digital image signals from a client device to a server device, comprising:

- establishing a connection between one or more client devices and server device;
- optionally making a copy of the image to free up system resources on the client;
- placing a copy of the image in a client queue if the image cannot be transmitted immediately;
- measuring the client resource availability of local resources and available processor time and maintaining historical information and trends;
- measuring the status and performance of the network connecting the client device and server device, and maintaining historical information and trends;
- increasing the size of the client queue if it becomes full;
- reducing the size of images to conserve storage space in the queue or to reduce transmission time between the client and server;
- transferring the image from the client device to the server device as a digital signal;
- persisting the image on the server device until it is processed or saved.

Tanaka does describe the first step of establishing a connection between a client device and server device.

Tanaka does not describe the second step of making a copy of the image to free up system resources.

Tanaka does not describe the third step of placing a copy of the image in a client queue. In your response to the third step, you state that "Tanaka discloses a relay server accumulating pieces of the image data before it goes to the archiver." The relay server is a remote component on the network and it not part of the client. Also, the accumulation that Tanaka is referring to is the cache to store the image for later use. In Tanaka, the image data is transmitted immediately to the terminal.

Tanaka does not describe the fourth step of measuring the client resource availability and available processor time.

Tanaka does not describe the fifth step of measuring the status and performance of the network. In your response to the fifth step, you state that "Tanaka discloses checking if the transfer of the data is at high efficiency, checking if any of the servers fail, and taking care of the failure if it exists." Tanaka is describing the function of a network load balancer which distributes requests among multiple server machines. In our invention, the client is a single device that measures network performance relative to its ability to transfer image information to a server device.

Tanaka does not describe the sixth step of increasing the client queue size if it becomes full. In your response to the sixth step, you state that "Tanaka discloses more protocol conversion servers being used if needed." Tanaka is describing adding more physical hardware when the existing hardware becomes insufficient to handle the load. In our invention, the client queue size is increased dynamically and in real time whenever the default or current queue size is full.

Tanaka does not describe the seventh step of reducing the size of the image to conserve storage space or reduce transmission time. In your response to the seventh step, you state that "Tanaka discloses reducing the size of an image is it is too large." Tanaka is solving a different problem and is describing a display issue where certain images must be transformed or resized to be displayed by a web browser. In our invention, the image is automatically compressed to save storage and reduce transmission time using a sequence of steps to prevent images from being discarded.

Tanaka does describe the eighth step of transferring images between client and server devices. In the Tanaka patent, the direction is from server to client. In our invention the direction is from client to server. However, the direction of travel is not significant.

Tanaka does describe the ninth step of persisting the image on the server until the image is processed or saved. In your response you refer to two Tanaka references (col. 6, lines 49-56, col. 10, lines 4-15). These two passages relates to using a load balancer to handle requests, and do not discuss retaining a copy of the image until the need for it is complete. Tanaka does disclose using a cache to retain a local copy of the image on the relay server.

Tanaka does not disclose elements 2,3,4,5,6, or 7. Therefore, claim **1** is patentable over Tanaka.

Claim 2

A system according to claim **1**, wherein the step of increasing the size of the client queue includes an upper limit to prevent the queue from growing beyond a specified size.

In your response for claim 2, you state that "Tanaka discloses using only a certain amount of protocol conversion servers." Tanaka describes that there are multiple hardware configurations based upon the requirements of the system. Tanaka further describes that this includes the number of relay servers used, the need for a cache, and the transfer rate of the network. These statements by Tanaka bear no resemblance with our claim. We disclose the need for an upper limit on the client queue because the queue size alone is not sufficient to insure that images on the client device will be transmitted to the server device. Increasing the queue size without bound means memory cannot be used for other, and potentially more important, purposes on the client device.

Tanaka does not disclose claim **2**. Because claim **2** depends from claim **1** and Tanaka does not disclose claim **1** or claim **2**, Claim **2** is patentable over Tanaka.

Claim 3

A system according to claim 1, wherein the step of transferring the signal from the client to the server can include encrypting the information on the client prior to transmission and decrypting the data once it is received by the server

In your response you cite Glass (U.S. Patent No. 6,332,193) in combination with Tanaka. Glass describes a method to encrypt and transmit biometric data securely over a network for online banking and internet commerce transactions. Tanaka discloses a system to transfer medical image data from a server to a terminal. Somebody skilled in the art will not combine the two inventions. Because claim **3** depends from claim **1** and Tanaka and Glass do not disclose claim **1**, Claim **3** is patentable over Tanaka and Glass.

Claim 4

A system according to claim **1**, wherein the step of transferring the image signal from the client to the server can comprise:

- transmitting image data from one or more clients to a gateway server, such that the clients consider the gateway server to be a server;
- buffering the image data on the gateway server;

- transmitting image data from the gateway server to the server, such that the server considers the gateway server to be a client.

In your response you refer to three Tanaka references (col. 5, lines 33-55, col. 6, lines 49-56, col. 10, lines 4-52). In these sections, Tanaka describes using relay servers to accomplish the task of obtaining the image from either its internal cache, archiver, or database. However, this does not disclose claim **4**. In this claim we describe a gateway server that mimics the functionality of the server device from the standpoint of the client device. It also mimics the functionality of the client device from the standpoint of the server device. If you remove the gateway server from the system, the client and server can still communicate, although with an increased risk of failures. In Tanaka, the system cannot function without the relay server because the terminals do not know how to communicate with the archiver and database.

Tanaka does not disclose claim **4**. Because claim **4** depends from claim **1** and Tanaka does not disclose claim **1** or claim **4**, Claim **4** is patentable over Tanaka.

Claim 5

A system according to claim **1**, wherein the step of reducing the size of an image comprises:

- selecting one or more reduction methods to reduce the image size from a plurality of lossless or lossy compression methods;
- reducing the current image, or any image in the queue when the queue becomes full;
- periodically reducing the size of the images in the queue, using reduction methods when processor resources are available.

In your response you refer to Tanaka (col. 10, lines 53-65). Tanaka is describing a display issue where certain images must be transformed or resized to be displayed by a web browser. In our invention, the image is automatically compressed using a sequence of steps to prevent images from being discarded. In our invention, images are resized not because of display requirements, but because of storage and network transmission issues. We disclose that the most recent image, or any image in the queue, can be

reduced to prevent images from being lost. This step is necessary when there is a network outage or the transfer capability of the network becomes severely degraded.

Tanaka does not disclose claim **5**. Because claim **5** depends from claim **1** and Tanaka does not disclose claim **1** or claim **5**, Claim **5** is patentable over Tanaka.

Claim 6

A system according to claim **5**, wherein the step of selecting one of more reduction methods comprises:

- estimating the reduction in image size possible for a specific reduction method;
- estimating the cost of this reduction where the cost includes the resources required for reduction as well as the time to reduce the image;
- performing the reduction if the cost is allowable and the reduction is considered meaningful;
- evaluating other reduction methods if the desired amount of reduction has not been achieved.

In your response you refer to the same section of Tanaka (col. 10, lines 53-65) as you did for claim **5**. My analysis of this is the same as in claim **5**.

Tanaka does not disclose claim **6**. Because claim **6** depends from claim **5** and Tanaka does not disclose claim **5** or claim **6**, Claim **6** is patentable over Tanaka.

Claim 7

A system according to claim **6**, wherein the step of determining if the cost is allowable comprises:

- checking the current system resources to see if sufficient resources and time are available to reduce the image;
- checking historical system resources and trends to estimate future resource availability;
- checking the current network parameters such as available bandwidth and throughput;
- checking historical network conditions and trends to estimate future network conditions.

In your response you refer to two Tanaka references (col. 6, lines 49-56, col. 10, lines 4-15). Tanaka is describing the function of a load balancer, whereby additional hardware can be added to reduce overhead and improve performance. We are claiming something completely different. The manual step described by Tanaka (adding additional hardware resources) is not the same as monitoring existing resources, estimating current and future network conditions, and using these estimates to decide if image reduction and compression is needed.

Tanaka does not disclose claim **7**. Because claim **7** depends from claim **6** and Tanaka does not disclose claim **6** or claim **7**, Claim **7** is patentable over Tanaka.

Claim 8

A system according to claim **1**, wherein the step of transferring the image signal from the client device to the server device comprises:

- storing the received image in a server queue or on a networked file system;
- increasing the size of the server queue if it becomes full;
- reducing the size of images to conserve storage space in the queue or to reduce storage requirements in the image database.

In your response you refer to two Tanaka references col. 10, lines 18-39, col. 10, lines 53-65). In these sections, Tanaka describes a system that operates without a local cache and describes how a load balancer can enhance performance. We are claiming something completely different. We are saying that the server device can contain similar buffer/reduction techniques as used in the client device. If there is a backlog of images on the server device, the image queue size can be increased, or the individual images can be compressed to converse space.

Tanaka does not disclose claim **8**. Because claim **8** depends from claim **1** and Tanaka does not disclose claim **1** or claim **8**, Claim **8** is patentable over Tanaka.

Claim 9

A system according to claim **8**, wherein the step of increasing the size of the server queue includes an upper limit to prevent the queue from growing beyond a specified size.

In your response you refer to Tanaka (col. 10, lines 18-52) as you did for claim **2**. Claim **9** can be analyzed using the same logic as claim **2** because claim **9** is the same as claim **2** with the exception that the queue management is on the server device side.

Tanaka does not disclose claim **9**. Because claim **9** depends from claim **8** and Tanaka does not disclose claim **8** or claim **9**, Claim **9** is patentable over Tanaka.

Claim 10

A system according to claim **8**, wherein the step of reducing the size of an image comprises:

- selecting one or more reduction methods to reduce the image size from a plurality of lossless or lossy compression methods;
- reducing the current image, or any image in the queue when the queue nears or becomes full;
- periodically reducing the size of the images in the queue, using lossless compression methods when processor resources are available.

In your response you refer to Tanaka (col. 10, lines 53-65) as you did for claim **5**. Claim **10** can be analyzed using the same logic as claim **5** because claim **10** is the same as claim **5** with the exception that the queue management is on the server device side.

Tanaka does not disclose claim **10**. Because claim **10** depends from claim **8** and Tanaka does not disclose claim **8** or claim **10**, Claim **10** is patentable over Tanaka.

Claim 11

A system according to claim **10**, wherein the step of selecting one of more reduction methods comprises:

- estimating the reduction in image size possible for a specific reduction method;
- estimating the cost of this reduction where the cost includes the resources required for reduction as well as the time to reduce the image;
- performing the reduction if the cost is allowable and the reduction is considered meaningful;
- evaluating other reduction methods if the desired amount of reduction has not been achieved.

In your response you refer to Tanaka (col. 10, lines 53-65) as you did for claim **6**. Claim **11** can be analyzed using the same logic as claim **6** because claim **11** is the same as claim **6** with the exception that the queue management is on the server device side.

Tanaka does not disclose claim **11**. Because claim **11** depends from claim **10** and Tanaka does not disclose claim **10** or claim **11**, Claim **11** is patentable over Tanaka.

Claim 12

A system for transmitting digital image signals from a client device to a server device, comprising:

- establishing a connection between one or more client devices and server device;
- optionally making a copy of the image to free up system resources on the client;
- dividing the available network bandwidth between the client and server into one or more pieces and assigning certain images to be transmitted using these reserved channels;

- placing a copy of the image in a client queue if the image cannot be transmitted immediately;
- measuring the client resource availability of local processor resources and available processor time, and maintaining historical information and trends;
- measuring the status and performance of the network connecting the client device and server device, and maintaining historical information and trends;
- increasing the size of the client queue if it becomes full; reducing the size of images to conserve storage space in the queue or reduce transmission time between the client and server;
- transferring the image from the client device to the server device;
- persisting the image on the server device until it is processed or saved.

This claim is similar to claim **1** but has an additional element (the third item). The analysis of items 1,2,4,5,6,7,8,9 follows the same logic as described under claim **1**. The third item describes how the available network bandwidth can be divided into a number of virtual pieces. This allows some images to be transmitted over a reserved section of bandwidth while other images contend and share any leftover bandwidth. In your response you state that "Tanaka discloses using different relay servers and piecing the image." Tanaka takes advantage of a load balancer to improve performance, meaning that an image comprising multiple pieces may get handled by different relay servers. We are claiming something completely different. By reserving a portion of the available bandwidth for one or more images, you greatly improve the chances that these more important images get transmitted to the server device. Images that get transmitted using any remaining bandwidth face a much greater chance of getting compressed or deleted

Tanaka does not disclose elements 2,3,4,5,6, or 7. Therefore, claim **12** is patentable over Tanaka.

Claim 13

A system according to claim **12**, wherein the step of reserving network bandwidth comprising:

- specifying the mapping of image type to a reserved piece of network bandwidth;
- using any remaining, unreserved network bandwidth for images that do not have any defined mapping;
- allocating a separate queue for each piece of network bandwidth or allocating elements from a single queue;
- identifying the type of image and routing this image to the appropriate piece of network bandwidth or queue;

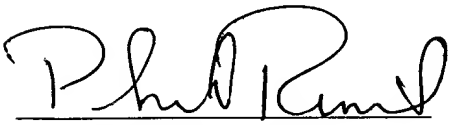
In your response you refer to Tanaka (col. 9, lines 1-37) and state "Tanaka discloses using different servers for different types of image data." We are claiming something completely different. This claim

discusses how network bandwidth can be assigned to different images or different image types. It does not discuss how servers are allocated

Tanaka does not disclose claim **13**. Because claim **13** depends from claim **12** and Tanaka does not disclose claim **12** or claim **13**, Claim **13** is patentable over Tanaka.

The Applicants respectfully ask the Examiner to reconsider and withdraw the rejections, and pass the application to issue.

Respectfully submitted,



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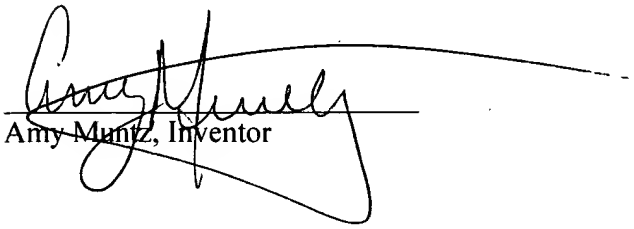

Amy Muntz, Inventor